Study of Multiplication of Guggal(*Commiphorawightii*) and its Food product's development for health betterment of Local community

A Synopsis

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Introduction

From the past few decades the world has substantially seen an exponential increase in population rise, inadequate supply of drugs, prohibitive cost of treatments, side effects of several synthetic drugs and the economic forum has always stated that the resources on earth are limited,an optimum use of available technology and new modificants will enhance the productivity to three folds and this has popularised the use of plant materials in sectors of medicines and agriculture for wide variety of human ailments. Due to its rare or minimal side effect treating with medicinal plant contemplate very safe and important fact arises that herbal treatments is independent of any age groups.Guggul*(Commiphorawightii*) comes under the critically endangered species and considered as important medicinal plant. It is mostly found in,Bangladesh and Pakistan. Rajasthan, Gujarat, Assam, Madhya Pradesh, and Karnataka are the states where it is being grown up in a good amount (Kulloli and Kumar, 2013).Guggul is a sweet-scented resin secreted by the Mukul myrrh tree (*Commiphoramukul*). Guggul has been used for treating a variety of medical conditions such as from arthritis and acne to haemorrhoids and urinary tract infections. Guggul is also acclaimed as a weight loss tonic.As maple syrup is extracted in a same manner Guggul resin is tapped from the treeand duration of harvesting begin as early in November to until late July.Due to a lack of knowledge regarding its conservation status (Ved D, Saha D) Guggul is critically considered endangered in India and listed as 'Data Deficient' in the IUCN Red Data list (IUCN, 2015).

The mainreasons for its fast disappearing populations are due toover-exploitation (tapping of woody shoots for its oleo-gum-resin), poor natural germination rate and slow growth rate. The resin which is extracted from stem of the plant has enormous value such ascholesterol reducing agent .The seeds and flowers are constantly produced in a definite manner in Rajasthan and nearby arid regions but during the seeds and flowers are not produced, because of the poor germination the large scale plantation is not possible, therefore there is urgent need to find out the solution in vitro methods for the growth of this endangeredspecies. Ofguggul (*Commiphorawightii)* for the genetic improvement and better production of active compounds in cell culture.The occurrence of non-pseudogamousapomixes,nucellarpolyembryony and autnoums endosperm formation which is presently threatened by overexploitation through hand pollination experiments A recent study demonstrates that Guggulsteroneup regulates the bile salt export pump (BSEP), an

efflux transporter responsible for removal of cholesterol metabolites, bile acids from the liver. Such up regulation of BSEP expression by Guggulsteronefavours cholesterol metabolism into bile acids, and thus represents another possible mechanism for its hypolipidemic activity. Guggulsterone has been found to potently inhibit the activation of nuclear factorκB (NFκB), a critical regulator of inflammatory responses. Such repression of NFκB activation by guggulsterone has been proposed as a mechanism of the anti-inflammatory effect of guggulsterone.The main constituents of oleo gum resin are:- minerals, gum, terpenes, sterols (Guggulsterol -I,-II,-III,-IV,-V), essential oils, sterones (Z-, E-, M-guggulsterone, and dehydroguggulsterone-M), ferrulates, lignans, and flavanones and also various bioactive compounds such as diterpenoids, triterpenoids, steroids, lignans, and fatty tetrolesters.Guggalsterone plays a vital role which controls the synthesis and transport of bile acid by supprswssing the physiological action of the nuclear hormone receptor i.efxr(Sinal and Gonzalez, 2002; Urizar et al.,2002)it also has been reported that it found for exerting the anti metastic effect by reducing the level of MMP-9, COX-2, and VEGF (Shishodia and Aggarwal, 2004). And also by modulating the expression of anti apoptotic genes for induncingapoptosis(Shishodia and Aggarwal, 2004).

Review of literature

Gupta *et al,* (1996) reported that the occurrence of non-pseudogamousapomixes,nucellarpolyembryony and autonyms endosperm formation which is presently threatened by overexploitation through hand pollination experiments and commipherawightii is a source of guggal steroids

Zhu *et al*,(2001) studied that the identification of cytotoxic components of commiphorawightii for purification and bioactivity directed fractionation by column chromatography

Jain and Gupta, (2005) studied that plant contains the crucial constituents mainly myrecene, dimyrecene and polymyrecene, Z-gugglusterone, E-gugglusterone, gugglusterone-I, gugglusterone-II, and gugglusterone which helps in curing many disesase like rheumatism, arthritis, hyperlipidemia, obesity, inflammation, atherosclerosis, wrinkles, acne and other diseases

Deng*et al*,(2007) reported that gugggulsterone eradicated cholesterol metabolites bile acids from the liver by upregualting bile salt export pump.and also proposed a system of antiinflamatory effect by repression of NF-κB activation by guggulsterone

Shishodia*et al,* (2008) studied that for modern drug development traditional medicine has an enormous opportunity through their molecular targetsion. Gum resin from Commiphorawightii (syn C. mukul) has and sudden paralytic seizures. Guggulsterone has been identified as one of the major active been used for centuries in Ayurveda to treat internal tumors, obesity, liver disorders, malignant sores and ulcers, urinary complaints, intestinal worms, leucoderma (vitiligo), sinuses, edemacomponents of this gum resinfor the inhibition of cell proliferation,induction of apoptosis guggulsterone is responsiblethey identified the molecular targets of guggulsterone in many diseases.

Dubey*et al,* (2009) reportedthat due to commipheraweightii importance and medicinal value the current research is towards finding antioxidant which is obtained naturally from the plant and the antioxidant property may be related to its vitamins,phenolic acid and micronutrients present in extract.

Haque*et al,* (2010)studied the finding the genetic variations among 7 populations ofCommiphora*wightii* through Random amplified polymorphic DNA .while analysing the genetic diversitythroughstatisticali methods they obtained that it has low diversity due geographic isolation,poor seed germination,slow growth pattern of the species.

Goyal*et al,* (2010) studied to identify the clinically significant bacteria against various extracts of of*Commiphorawightii* gum resin. Due to rapidly wide spread emergence of resistance among pathogenic bacteria against available anibiotics so there is urgent need to discover a novel antibiotic and need to to identify the clinically significant bacteria against various extracts of of*Commiphorawightii* gum resin after testing and going through many process they obtained *Commiphorawightii* gum resin is shown to have promising antibacterial activity that could be very useful in the discovery of novel antibiotic.

Qureshi and Chahar, (2013) studied the importance Commiphorawightii plant due to its medicinal properties and its medicine which use to treat in Arthritis, Rheumatism, Haemorrhids, Urinary disorder, obesity, skin disease and high cholesterol .due to iis slow growing nature and poor seed germination

Qureshi and Chahar,(2015) studied that how we determine the various biochemical tests.also identified the medicinal value of the plant .Guggul plant commonly known as Commiphorawightii. It's belonging to family Burseraceae and its plant belongs to class Magnoliopsida. Use of medicinal plants against disease is not new. We are using herbal plant extracts in our common life from human evolution. So many medicinal plants are available in our environment, which can be used for our benefit in direct or indirectly. Guggul plant (Commiphorawightii) is also contains lot of medicinal values. For checking the quality of these medicinal plants we have to determine the various biochemical tests, for its merits and demerits.

Sarka*et al*,(2017) reported the antimicrobial activity obtained from extraction leaves of commiphoraweightii through synthesis of sliver nanoparticles.tha application of silver nanoparticles in drug delivery system has future productive results

Miller and Samuels, (2019),studied the understanding of anti-obesity effects of gugglesterone and direct and indirect stimulation of M2 macrophage polarization. And establish the potential anti-obesity effects of gugglesterone

Mruthunjaya K *etal*, (2019) reportedthat guggal plant contain various crucial constituents like liketerpenoidal compounds, steroids, sterols, amino acids, sugars, guggultetrols and flavonoids are present which are responsible for its therapeutic action.*Commiphorawightii*, also known as Indian bdellium, Guggul, a flowering plant (Family: Burseraceae), which produces a gum resin .It has many medicinal properties .It is a treasure for many chemical constituents.Guggul plant mostly present in the arid and rocky tracts of the world It is the medicinal treasure for various disorders like inflammation, obesity, rheumatism and disorders of lipid metabolism. Various chemical constituents like terpenoidal compounds, steroids, sterols, amino acids, sugars, guggultetrols and flavonoids are present. In this review brief information about the chemical constituents had given which are responsible for its wonderful therapeutic action.

Objectives:-

1.Callus induction by using various explants ofGuggul(*Commiphorawightii)*.

2.Maintenance of cell suspension culture and election by electors of Guggul*(Commiphorawightii)*.

3.Biochemical estimation of gugglesterone of cell suspension culture cells of Guggul (*Commiphorawightii*).

4.Formulation of various food products by using tissue culture ofGuggul(*Commiphorawightii)* cell extract.

Methodology:

1.Micropropagation of plant: For the *Commiphorawightii*. callus culture, leaf explants will be surface sterilized by washing with tap water, with sodium hypochlorite and Tween 20 thereafter. The sheets are then rinsed 3 times with a solution of mercury chloride and then with autoclaved water in a laminar airflow chamber. The sterilized sheets will be cut into small disks and placed in solidified MS medium pre-sterilized by autoclaving and supplemented with a different concentration of growth regulators in 100 ml. Culture flasks. The culture flasks will be placed in a culture chamber with thermostat maintained at a temperature of 25 ± 2 ° C, photoperiod of 500 micromol-2s-1 and 16 hours. The culture medium will be changed every 2 weeks.

2. **Suspension culture of *Commiphorawightii***.: For the establishment of cell culture suspension, a callus culture from 15 to 20 days commiphorawigtii will be transferred to the 150 ml flask Erlenmeyer mix with medium MS liquid with different concentrations of growth hormones and culture bottle placed will be shaking incubator maintaining a temperature of 24 ± 1 ° C and stirring at 110 rev / min. The culture suspension will be subcultured every 7-8 days.

3.**Biochemical estimation of secondary metabolite**:Through HPLC analysis the estimation of secondary metabolites is done.For HPLC analysis extract of the callus was dissolved in 30% ethyl acetate in methanol (HPLC-grade) to yield a final concentration of 100 mg dried tissue per 20 µL 17. Samples were filtered through syringe filters (0.45 µm, 4 mm nylon filter, National, USA) to remove suspended particles and transferred to auto sampler vials.

4.**Food formulation**:-the food product converted into a dehydrated powder in a forms of tablets.FirstlyPhysicochemical characterization of resinoids was carried out according to the method described by Association of Official Analytical Chemiststo determine their appearance, %yield, %moisture, %ash, acid value (mg/KOH/g), saponification value (mg/ KOH/g), ester value and iodine value (g/g). sample were analysed by on a water alliance

hplcsystem.then homogenized gum resin sample was accurately weighted and mixed with MeOh and sonicated for 20 min and then centrifuged for 15 min.

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